ANGELS CAMP MUSEUM

Educational Packet

Grades 4-6

Angels Camp Museum

P.O. Box 667 | 753 S. Main St., Angels Camp, CA 95222

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Dear Teacher,

Thank you for choosing the Angels Camp Museum for your field trip. This packet was designed to help you and your students prepare for your visit to the Museum.

During your tour you will discover the many layers of local history and learn about our region’s part in the development of California. If you have any questions, please don't hesitate to contact me.

Sincerely,

Jim Miller, Education Coordinator

Angels Camp Museum

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Contents of the Packet:

1. Background Information for Teachers

a. Introduction to the Museum

Angels Camp Museum started as an idea proposed in 1945 by local resident William G. Daniels. Mr. Daniels believed the community deserved a special place that would recognize and preserve regional history for generations to come. With the help and cooperation of the City of Angels Camp, the Lions Club and the Angels Boosters, the Museum opened its doors in 1951 under the directorship of Mr. Daniels. The original building still serves as the welcome desk, bookstore and exhibit area at the street level. Since 1951 the Museum has grown to the current three-acre facility with the addition of the Carriage House and Mining & Ranching Barn.

The Tour

School tours takes approximately 90 minutes and is divided into ½ hour segments that explore all three buildings. Each segment focuses on part of the overall story as the students experience the extensive collections of original artifacts. The segment themes are as follows:

Gold Frenzy and the Rush Towards Industrialized Mining
Takes the students through the beginnings of placer mining in the Gold Rush and the later hard-rock mining era so important to Angels Camp. *Emphasis on History, Social Science and Geology*

Development of Transportation and a New Merchant Economy
Tells the story of the early roads and the transition from mining camps to growing established communities. *Emphasis on History and Social Science*

Settlement and Growing Prosperity Creates a Consumer Class
Celebrates the benefits of domestic bliss and the niceties of life by exploring how the community kept up with the times in the late 1800s. *Emphasis on History and Social Science*

b. History of Gold Mining: From Placer to Hard Rock

At the beginning of the Gold Rush there were very few professional miners in California. The first prospectors on the scene immediately after the discovery of gold, were the workers building the saw mill for John Sutter. These 48ers had to improvise their technique and pan with whatever was at hand. The luckiest ones needed only a knife to pry the gold from cracks in the river's bedrock. In early 1848, it was that easy.

Word of the discovery spread when those first prospectors started exchanging their raw gold for supplies in the valley stores. Soon more and more men came to the river to mine. One of those early arrivals was a seasoned miner from Georgia's gold rush of 1829. His name was Issac Humphrey and he had come to California for his health, not for gold.

Issac's arrival would be a game changer as he brought his professional mining experience to an amateur event. On or about March 9, he built the first rocker or cradle on the American River and the mechanization of the Gold Rush began.

Within a few years, better technology and the growing number of miners, accelerated the consumption of the easier to reach surface gold. Searching for new opportunities, miners had discovered that deeply buried prehistoric riverbeds had the potential for gold deposits but no practical way had been devised to mine them. In 1853, a man named Edward Matteson, had the original idea of blasting those ancient rivers free of their treasure, using a water nozzle. Over the coming decades, this little nozzle grew into that giant water cannon we call a monitor. On the Museum’s grounds you will find a large original monitor to study.

For Angels Camp, the easy placer gold was gone within a year or two and only the merchants kept the little town going until the first quartz

deposits were discovered in 1854. On and off through the 1860's and 70's, small scale hard-rock mining continued with mixed but promising success. It wasn't until the 1880's that improved technology and the outside capital to fund it came together and brought industrial scale deep mining to Angels Camp.

People came to California from many nations seeking a better life and employment in the mines. Many of today's local families of Cornish, Irish, Serbian and Italian heritage, have gold rush ancestors.

In the 20th century, it was the two world wars that brought an end to the mining industry, not the lack of gold. The mining legacy left Angels Camp with hundreds of miles of tunnels running deep under the City, including directly under the Museum.

c. History of Transportation in the Mother Lode

In the beginning of the Gold Rush, most prospecting miners carried their supplies with them while blazing new trails through the rough country. As their claimed ground grew into established camps, freight packers, many of them Mexican, found their gold running mule supply trains up to the mines. Henry Angel and fellow merchants of the Southern Mines, would have purchased their goods from wholesalers in Stockton and arranged to have it freighted here. As these mining camps grew into towns, the once adequate trails and crude roads were enlarged and improved to handle the increasing traffic.

By the late 1850's, mule trains had be reduced to handling one fifth of the total freight brought to the Southern Mines. The bulk of freight was

moved in large wagons. Some of these wagons, when pulled by 10 mules, could carry 10 tons of goods. Many times they would link several wagons together to form a true wagon train. The Museum has a great example of a covered freight wagon.

Following in the footsteps (or wagon ruts) of the freight companies came stage lines to move people, the U.S. Mail and even gold from the mines. In the Museum are examples of stage wagons and a stage coach. As businesses in Angels Camp prospered, many merchants purchased specialized vehicles for deliveries or to provide services. Many examples of these are in the Museum's collection as well. By the late 1800's a new kind of vehicle arrived in California, the horseless carriage.

The dawn of the automobile age brought about new challenges for California as these revolutionary vehicles required better roads than their horse-drawn cousins. Many if not most of the old, private wagon roads came under State control starting in 1895. The newly formed Bureau of Highways initiated the paving of the dusty dirt and gravel roads for the new "motorists" just in time. By 1905 California already had 17,000 autos on the road.

d. Artisan Interactive Displays

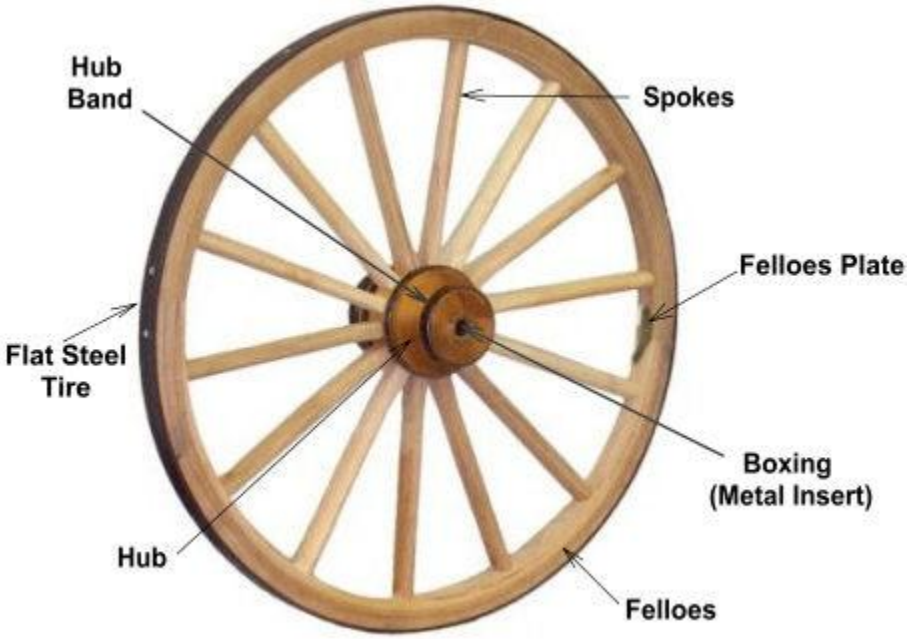
The Carpenter's Shop

In the beginning of the Gold Rush, the carpenters who weren't working as miners were probably building mining equipment. The rocker is a perfect example of the kind of early mining machine that carpenters specialized in and we have a good example to show the students. As mining camps grew into towns, many carpenters found work constructing commercial buildings along with the cabinets,

counters and other furniture that merchants needed to run their businesses.

During this time period many trades were highly specialized such as wainwrights who built wagon bodies and wheelwrights who built the wheels for those wagons. To help keep the community rolling, many carpenters found themselves working on wagons and wheels too. The Museum's Carpenter Shop has a feature that teaches wooden wheel construction through interactive play.

Carpenter's Shop Vocabulary



Face- Front of the wheel, the back is called the back

Hub- Center piece of the wheel. Common hubs are wooden with metal bands. The illustration above shows one of these.

Boxing- Is the metal lining in the center of the hub.

Spokes- The radiating ribs of the wheel. They can be arranged in a staggered pattern on the hub or all in line as seen in the above example.

Dish- The cupped effect caused by the spokes slightly angling out from the hub. This helps to keep the wheel stable and strong.

Spider- Name given to an assembled wheel when all the spokes are mounted to the hub but no felloes are attached.

Felloes- Name for the sawn or bent sections that encircle the wheel and form the outer rim.

Tire- The tire is the outermost part of the wheel. Usually made of iron or steel, it helps hold the wheel together and protect it from road damage.

Tire Bolts- Special bolts with counter-sunk heads that help hold the tire on the rim. These are mounted through the tire and felloes between the spokes with a nut on the inside of the felloe.

The Print Shop

Early in California's history, long before anyone dreamed of the internet, people relied on the printed or written word to keep informed or connected. The ability to print a page with a press, using changeable type, started around 570 years ago with Gutenburg's revolutionary idea. It's astonishing that the Museum's Washington style press, in use only 140 years ago, still has a lot in common with its Medieval ancestor.

In the 1800's, this was the technology that kept the people of California informed about local, national and international news. Hundreds of newspaper and print shops sprung to life all over California and yet the printing of every book, poster and newspaper started by setting type, one letter at a time.

This Museum display affords students the opportunity to learn how printing presses worked and to discover how young apprentices, known as Printer's Devils, learned the trade.

The Printer's Devil

Definition and Origin

By definition, a printer's devil is an apprentice in a printing shop. Their duties might include mixing tubs of ink, fetching type for the typesetter or any number of tasks as they learn the trade. Famous people like Benjamin Franklin, Thomas Jefferson and our beloved Mark Twain started their working careers as printer's devils.

The origin of the term is uncertain. One of the possibilities is that when the apprentice's hands became stained with ink, they resembled the devil's. Another version comes from printers calling upside-down letters or misspelled words, the work of a mischievous devil in the print shop. Whatever the origin, the term has been in use at least since the 18th century.

A daguerreotype of young Samuel Clemens as a Printer's Devil

(Note the composition stick spelling out his name)

The Textile Shop

Early in our Country's history, home and small production weavers kept up with the demands of their families and local consumers for fabric. Every piece of hand woven cotton or linen started with the growing of the plant (cotton or flax) followed by the processing of its fiber. After a number of complicated steps, it would be spun into the thread that would be woven into cloth. Sheep were shorn of their wool, which would then be spun into yarn using a spinning wheel or later, a machine called a spinning jenny.

The Industrial Revolution of the early to mid-1800's put an end to the need for homemade cloth as factories were producing it faster and cheaper, making it widely available. That historic shift did not put an end to the weaving of homemade fabric as textile artisans found their niche in a smaller market. The interest in handcrafted goods continues to this day and helps to preserve the traditional craft of spinning and weaving.

The Textile Shop at the Museum has large historic floor loom with a local history, and a small interactive loom for students to experience what it is like to weave cloth.

Print Shop & Textile Shop Vocabulary

Brayer – A device for rolling ink onto type

Case – A chest of drawers to hold type

Chase – The metal frame used to hold type in place for printing

Furniture – Small wooden pieces used to fill the space between type in the chase

Heddle – A sometimes comb-like device that separates the warp threads on a loom

Loom – A open framed device designed to weave threads into cloth

Press – A large mechanical devise used for imprinting paper with inked type

Quoin – A small wedge shaped metal piece used with a key to tighten the layout of type in the brayer

Shed – The space opened up by warp threads as they pass through the heddle on a loom

Shuttle – A small wooden form that holds the weft threads and passes through the shed

Type – Small metal forms with reverse letters or numbers on their ends, used to print in a press

Warp – The long threads running through a loom and separated by the heddle

Weft – The thread wound on the shuttle and fed through the shed perpendicular to the warp. The interweaving of warp and weft threads creates cloth.

2. Pre-visit Activities

a. Being a Wheelwright

The wooden wheels of an old fashion wagon are often taken for granted by today's casual observer. Considering their contribution to the function of a vehicle, it's worthwhile to understand a little about their construction and history. In this fun lesson your students will learn the parts of a common, simple wooden wagon wheel and how they are made, while constructing a facsimile out of easily found modern materials. In the 1800's, the wheelwright or wheel maker was an important craftsman who contributed to the function, mobility and prosperity of local communities that helped develop California.

When visiting the Museum's Carriage House, the students will discover many types of wooden wheels and their use. In the carpentry shop, they can also try their hand at building a wood wheel.

Materials and Tools

- 2 paper plates (thinner is better)

- 1 paper or Styrofoam cup

- 3 sharpened pencils (2 short, 1 long)

- scotch tape

- scissors

- stapler

Familiarize yourself with the various parts of a wheel and the steps necessary to its construction. Wooden wheels are of course made of wood but also have parts made of iron. The iron parts are critical to the design and even the type of wood has to be considered.

Let's start with the **hub.** The hub is turned on a lathe from a piece of dense wood like elm. It needs to be true and round with a center hole for the eventual axel. Each end of the hub would be banded with iron supplied by a blacksmith. These bands are shrunk on using a process we will discuss later. Once the hub is completed, rectangular holes called **mortises** are carved all around the outside center in an evenly spaced pattern.

These mortise holes are for the **spokes** that will radiate out from the hub. It's easy to see how geometry would play a part in laying out the angle of each spoke. A good wood choice for spokes is hickory because of its springy quality. You don't want those spokes to snap. Each

spoke is carefully crafted and fitted into the hub. When all the spokes are fitted to the hub we have created a **spider**.

Since most wheels were built to a certain size we would be working towards a known diameter. Using that information the next step is to construct the outer rim of the wheel. Most wheels have rims made of sections called **felloes.** These felloes are made of steam bent pieces of oak or ash that are fitted together and eventually drilled for the other end of the spokes. Once the felloes are fitted to the spokes, we are ready for a good challenge.

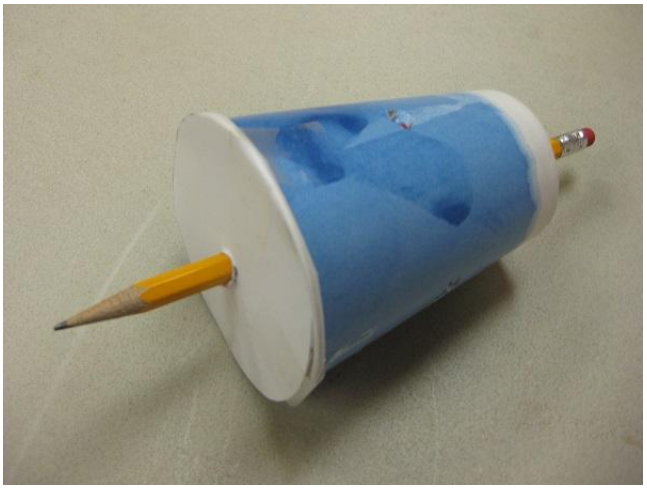
We need to make a measurement of the circumference around the outside of the felloes and deliver that measurement to our friend the blacksmith. The blacksmith will bend an iron band into a perfect circle to fit around our wheel. Eventually this will become the **tire** but it's not quite ready yet. The blacksmith purposely made the tire about a 1/4" smaller in circumference. In order to make the tire fit, it will be heated in a fire to the point of glowing "black red." At this point it expands enough to fit over the finished wooden wheel. A quick quenching with water shrinks the tire onto the wood and with a few added fasteners, our wheel is complete.

Activity

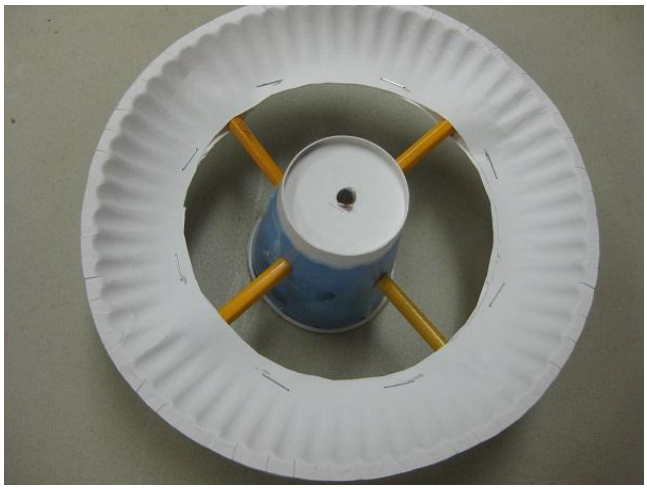
Groups of three or four students work best for this activity.

Begin by cutting out the center of two paper plates as shown.

With the two rings together (back to back), evenly staple around the inside. You may have to mark the plates as it's important that there be 8 evenly spaced staples. Start with 4 and then staple in between them. These rings represent the **felloes** that make up the rim of the wheel.



Take a paper or Styrofoam cup and use it to trace a circle (open end) onto the scrap center of the plate from step one. Cut out the small circle Tape the paper circle onto the cup as shown and using the pencil, puncture a center hole through both ends of the cup. You have now created the **hub** for your wheel**.**



In the final step, insert the pencils from the outside of the **felloes,** between the staples and into the **hub.** Insert the longer pencil all the way through the cup first and then follow with the two shorter pencils**.** The pencils represent the **spokes.** Congratulations, you have built a model of a wagon wheel.

Now let's talk about it! Try some of these questions.

a. Do you think that math would play a part in the making of a wagon wheel?

b. Would a beginner wheelwright have to go to school to learn how to build a wheel or are there other ways to gain the knowledge?

c. What does it mean to be an apprentice, working under a Master Wheelwright?

d. Can you name any woodworking tools that might have been used to make a wheel?

e. What kind of wood would you use to build your wheel? Soft? Hard? Springy?

f. Why would a wheelwright need the help of a blacksmith?

g. Do you think you could have made a living making wheels? Why?

b. Gold Miner's Rocker

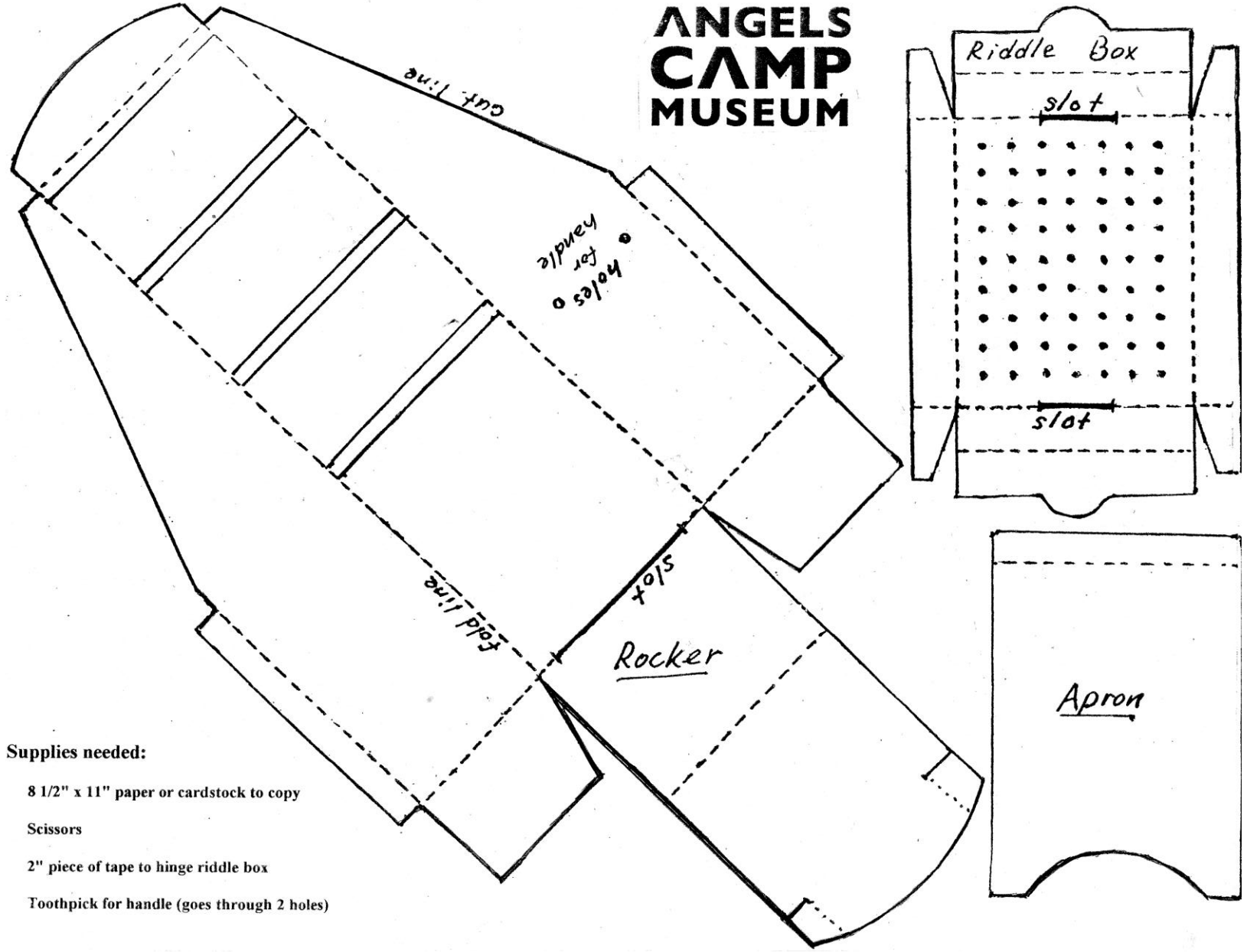
Lesson

The California Gold Rush cradle, aka rocker, was one of the most important innovations to enter the mining scene in 1848. Introduced only a couple of months after the discovery of gold, its design and function brought about a radical shift in how placer mining was approached. Instead of solitary miners with their gold pans, small mining companies formed to benefit from the cooperation this new machine fostered. With just a pan, a miner was expected to wash ¾ of a cubic yard of gravel in a 10 hour day to find any gold at all. Three miners cooperating on a cradle would be expected to wash 2 ½ cubic yards of gravel each in the same 10 hour day. By volume alone, a miner just increased his chances to find gold. It's obvious to see why everybody wanted one of these machines.

When your students visit the Museum they will have the opportunity to see and hear about our original cradle, and they will also have the opportunity to interact with our full-size replica copy.

We have already touched on the importance of the cradle to the Gold Rush but how did it actually work? If you study the illustration you will notice that there are three basic parts to the cradle. When in use, the cradle was always on a slope with a high end and a low end. Mounted on top of the high end would be a shallow box with a perforated iron bottom. This box is known as the **riddle box.** When using the cradle, the riddle box is what you shovel the gravel into. It is fundamentally there to act as a sifter. Directly under the riddle box is what is known as the **apron**, or a panel of wood or cloth covered framework intended to deflect the washed gravel to the back of the cradle. Since the cradle is on a slope and being systematically rocked back and forth, the washed gravel zig-zags along the bottom of the cradle on its way towards the lower end. Thin strips of wood known as **riffles** are nailed at intervals along the bottom of the cradle. These riffles act as dams to trap the gold in the washed gravel. Gold by nature is very heavy and sinks to the lowest level when allowed.

When in use, one miner could stand or sit and rock the cradle while another bailed water into the riddle box full of gravel with a **dipper**. A third miner could busy himself digging the gravel up and bringing it to the stationary cradle. Several times a day, the cradle would be cleaned-up by scraping behind each riffle. The scrapings would be collected in a gold pan and "panned-out" at the end of the day.

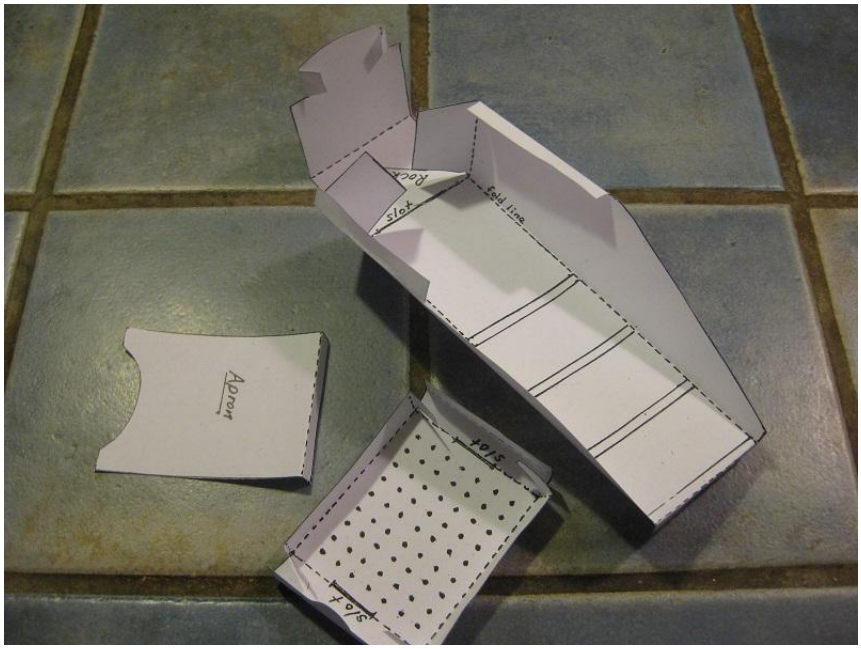


Supplies needed:

- 8 1/2" x 11" paper or cardstock to copy
- Scissors
- 2" piece of tape to hinge riddle box
- Toothpick for handle (goes through 2 holes)

Activity

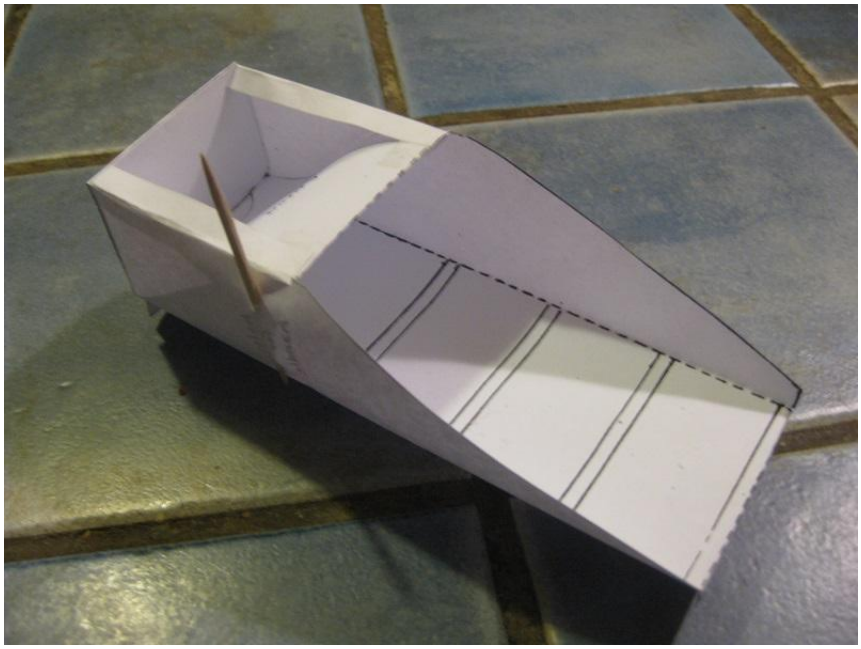
This is a group activity for 2-3 students.



Begin by cutting out the three pieces and folding along the dotted lines as shown.

With the point of the scissors, carefully cut the slot in the rocker piece and the two slots in the riddle box. Fold the tabs into the slot to secure the back of the rocker and the ends of the riddle box as shown.

Punch two small holes in the side of the rocker for a stick. This will be your handle.



Attach the riddle box to the upper back of the rocker with a piece of tape. This will act as a hinge. Tape can also help anchor the apron as shown.

Congratulations, you have just constructed an accurate model of a classic Gold Rush cradle! Use this opportunity to open a dialogue about this machine and its importance to the story of mining.

Try these questions.

a. Do you think you could have made a real cradle in the early Gold Rush?

b. Where would you buy the wood, sheet of steel or nails?

c. If you could not make you own, how else could you get one?

d. How many partners would it take to use a cradle effectively? Can you name their duties? How would you divide the gold you found?

e. Why do you think the cradle fell out of favor with the miners?

3. Post-visit Activities

a. Telling Stories with Objects

Have you ever felt overwhelmed by "things" when you visit a museum? There's so much to look at and never enough time. Is it even possible to learn the story that every object might teach us? One step towards understanding is to improve our skills of observation. By learning to focus on an object and mentally dissect its every part, we can peel away the mystery and perhaps discover its secrets.

Try to train you brain to analyze a common everyday object by studying its form and the details of its construction. Create a story around the object to help you understand how and why it was made.

For example, let's take a pencil. Make a list of all of the materials of which the pencil is made.

Wood (the body of the pencil)

Metal (the socket for the eraser)

Paint (a coating on the outside of the wood)

Graphite (the writing part, or lead)

Rubber (the eraser for correcting oops!)

Try to imagine how that pencil was made. Speculate as to the actual steps of construction. Handmade? Mass-produced in a factory? You decide. Why was it made? Is it used or new? How old is it? How is it used? Who might have owned it? Create a story about a day in the life of a pencil.

Write down your ideas and make a report. You can't do this with everything in a museum but this kind of thinking will lead to a better understanding of the important artifacts preserved in museums and even the world around us. There are lots of "things" out there. The more you see, the more you know. The more you know, the more you see.

b. Words you Heard at the Museum

Can you match their meaning?

1. Mill	a. object from the past
2. Phonograph	b. lightweight horse drawn vehicle
3. Kinetoscope	c. violin
4. Thresher	d. wagon to transport the deceased
5. Reaper	e. tradition or legacy
6. Fiddle	f. early movie projector
7. Packer	g. person who runs a business
8. Artifact	h. machine that crushes or grinds
9. Quartz	i. water cannon used to placer mine
10. Merchant	j. person who moves goods by mule
11. Buggy	k. early machine for playing sound
12. Rocker	l. deposit of loose or free gold
13. Monitor	m. gold ore
14. Placer	n. early machine used in mining
15. Heritage	o. machine for harvesting grain
16. Hearse	p. large machine for separating grain

c. Write a Letter Home as if you were a '49er

Challenge your students to imagine that they are in California during the Gold Rush. Once the mood is set, have them write a letter home as if it was 1849 and they are a miner. Encourage them to use what they have learned and experienced at the Angels Camp Museum when composing their letters. Once completed, have the students share their letters by reading them aloud.

d. Rock Candy Recipe

The Museum has an extensive collection of rocks and minerals with many examples of crystals.

To grow your own crystals in the classroom, follow these simple steps.

Some basic things you will need:

- 4 cups of sugar
- 2 cups of water
- small saucepan
- wooden spoon
- clean glass jar large enough for water and sugar
- measuring cup
- length of cotton string
- weight for end of string (metal washer etc.)
- waxed paper
- pencil or wooden dowel

How to do it:

- heat water to boiling point in saucepan
- dissolve sugar in water, stir with spoon
- remove from heat and carefully pour into jar
- tie weight to one end of the string, tie other end to the pencil
- the string should be shorter than the depth of the jar
- dip the string into the jar, remove and place on wax paper
- cover jar
- make sure the string is straight and let it dry for several days

- place string in jar suspended by pencil at the opening

- every day more and more crystals will form

- after at least a week, remove and enjoy

Looking, Learning and Eating!

4. Answer Key

Words you Heard at the Museum

Answers: 1. h, 2. k, 3. f, 4. p, 5. o, 6. c, 7. j, 8. a, 9. m, 10. g, 11. b, 12. n, 13. i, 14. l, 15. e, 16. d

5. Suggested Resources

Clappe, Louise Amelia Knapp Smith. *The Shirley Letters: From the California Mines, 1851-1852*. Berkeley: Heyday, 1998

Fleischman, Sid. *By the Great Horn Spoon*. Boston: Joy Street/Little, Brown & Co. Inc., 1988

Holliday, J.S. *The World Rushed In*. Norman: University of Oklahoma Press, 1981

Levy, Jo Ann. *They Saw the Elephant: Women in the California Gold Rush*, Norman: University of Oklahoma Press, 1992

The Huntington Library

www.huntington.org/education/goldrush/index.html

The Oakland Museum

www.museumca.org/goldrush/fever.html

The Online Archives of California

www.oac.cdlib.org